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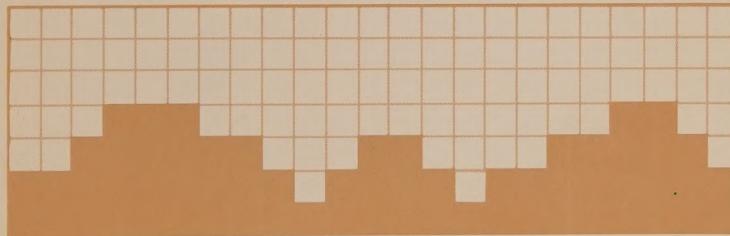
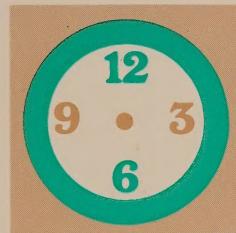
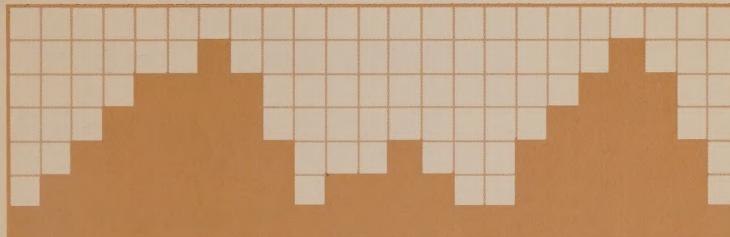
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Energy Conservation through Travel Demand Management

An Overview of Municipal Opportunities

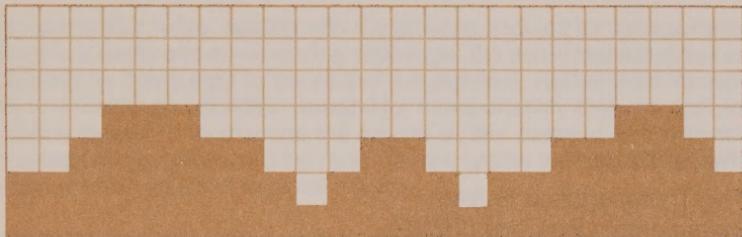




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Energy Conservation through Travel Demand Management

**An Overview of
Municipal Opportunities**

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March 1983

New Perspectives in Transportation

For a municipality today, dealing with the growing demand for transportation services is a costly and never-ending challenge. But some municipalities are succeeding by going right to the root of the problem. Rather than focusing solely on meeting an unbridled demand for transportation, they are applying innovative measures to manage the growth in this demand that minimize both energy consumption and the need for new capital expenditure *and* that maintain present levels of user satisfaction.

Thanks to the pioneering efforts of a number of North American municipalities, there are today a range of proven transportation measures that increase a system's efficiency by spreading demand over the existing facilities and by creating an environment in which transit, ridesharing, and walking are the options chosen by commuters. To see the real significance of these measures, municipal officials need only look at their transportation and land-use systems in a broader perspective and ask some basic questions. For example:

- Does it make economic sense to design and build a transportation infrastructure to handle two daily peak travel periods of an hour and a half each, five times a week, when demand at other times is only a half or a third as great? Widespread introduction of flex-time can help spread rush hours over a greater portion of the workday.
- Does it make sense to plan and build housing developments that are based on the hidden assumption that oil still costs only \$2 a barrel? Building more compact housing in proximity to jobs and services, with street systems designed for transit, can ensure reductions in energy use, both for home heating and for travel.
- Does it make sense to encourage travel by single-occupancy automobiles into the downtown area by maintaining parking policies that do not account for the real cost of such travel to the municipality and the taxpayer? More creative tax and parking fee structures can make the ridesharing and transit options more attractive.

Flex-time, multi-family residential construction, and parking fees, are only a few of the measures that promise relief to municipalities in their search for creative solutions to transportation and energy challenges. This booklet contains a full range of other measures as well — ways that land can be used, alternative work schedules, innovative parking strategies, and zoning to restrict automobile traffic. Not only have these measures proved successful in reducing road congestion, saving fuel, and making better use of public transit; they are also economical. What they require of the municipality are planning and management rather than capital expenditure.

In fact, municipal leadership is vital to ensure that Ontario meets the energy challenges of the coming decades. Just as important is the support provided by more senior levels of government. But citizen groups and business organizations have important roles as well. By actively participating in evaluating, planning, and implementing some of the measures in this booklet, they can help ensure their appropriateness and effectiveness.

These measures are successful because, when properly applied, all sectors of the community benefit from their implementation. Homeowners and drivers save in fuel costs. Commuters gain improved travel conditions and shorter weekly travel time. Transit riders enjoy more comfortable and convenient service. Business and professional people have the advantages of increased activity in the downtown area. And, finally, municipal governments benefit from a better use of transit facilities and vehicles, improvements in traffic flow, and a decreased need for capital expenditure on streets and public vehicles.

Municipalities that succeed in expanding their transportation perspective and begin to implement some of these travel-demand-management measures will reap significant benefits in the years to come.



Land-Use Planning

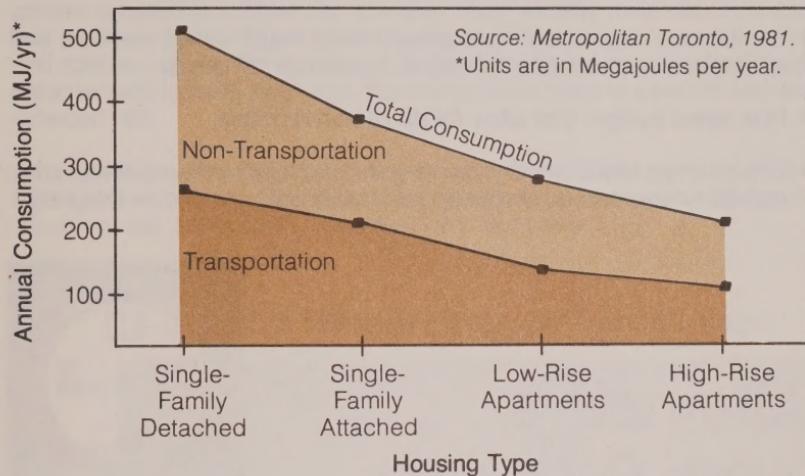
Municipalities that are truly planning for tomorrow, thinking ahead about the travel demands of the 1990s and the resources available to meet them, will consider land-use planning of paramount importance. It holds the key to future transportation demand. The greater the density of human activities in any community — no matter what its size — the greater will be the opportunity to provide transportation that uses fuel efficiently. And human-sensitive design can make this more compact development not only appealing but successful.

Statistics gathered from North American cities underline the kinds of savings to be achieved. In Los Angeles and Houston, where employment and housing are spread out, the average driver uses 8 more litres of gasoline per week than in New York or Chicago, where housing and employment are more concentrated and extensive transit systems are in use.

One approach, then, is to bring together the sites of major community activities — home and work places, shopping areas, and recreational facilities. Any growing community, no matter what size it is, can benefit.

The essential thing is to introduce the energy-conscious planning concepts at the earliest possible stage in development. Municipalities might consider as a model an Ottawa-Carleton resolution passed in 1979. It required that a developer incorporate a wide range of energy-conservation features in planning a particular subdivision. Included were such items as improved insulation levels, use of solar heating, fewer exterior walls, street layouts to improve transit flow, district heating, a good network of walking and bicycle paths, and proximity to commercial, community, and employment locations.

Energy Consumption by Housing Type



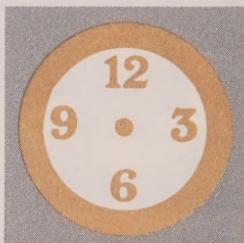
Proven Measures

There are a number of specific measures that municipalities have used to implement energy-conscious land-use planning.

- Give preference to low-rise, attached, and multi-story housing rather than single-family dwellings. Studies have shown that higher-density housing often leads to greater use of public transit and lowered use of automobiles. In Ontario, space heating in semi-detached houses takes an estimated 25 per cent less energy than in detached houses. In row houses, it takes 50 per cent less.

- Encourage mixed-use buildings. Combine large office, shopping, and residential complexes into a single structure. The ManuLife Centre in Toronto is an example.
- Improve the balance of people and jobs in the community by the use of mixed zoning. If home and work places are close, many people will be able to walk to work, particularly if the housing type is compatible with the nature of local jobs. Others who rely on commuting may find public transit more convenient than using an automobile.
- Provide compact residential development on smaller lots in locations easily served by public transit. One of the main purposes of this measure, called residential clustering, is to reduce the length of streets and utility services. Hence it saves capital expense and energy in construction and makes transit more efficient and attractive thereafter.
- Concentrate new urban development along major transit corridors and around suburban centres. Increased transit use will result.
- Plan street designs that allow for direct transit routes.
- Utilize vacant lots in the city centre and in suburbs for new development; especially where work, shopping, and residential uses can be integrated.

Alternative Work Schedules



Alternative work schedules are a way of spreading peak travel demand over a broader time frame. They make street and transit operations less congested and therefore more efficient in peak hours. Their greatest impact is on the central business district and other major employment concentrations.

There are several types of alternative work schedules to choose from, with some differences in the resulting impacts.

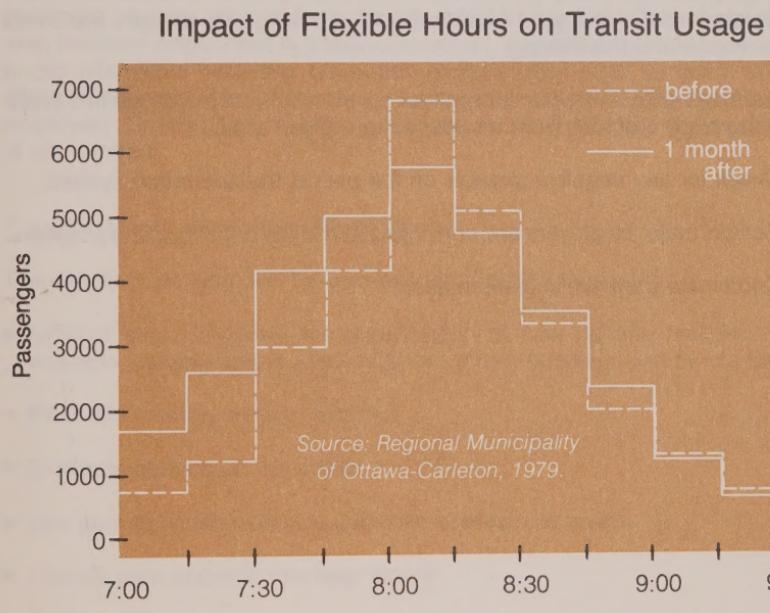
Variable Work Hours

These include two kinds of programs — staggered work hours and flexible work hours.

- In staggered-work-hour programs, the employer sets specific work hours for groups of employees, spreading the beginning and ending times over a one- or two-hour period. Groups arrive and leave 15 to 30 minutes apart. The outcome is a lessening of automobile congestion at the employment site. There may, however, be a decrease in ridesharing and some difficulties in scheduling transit. But if transit demand is high, staggered work hours can help by levelling off peak-period congestion.
- In flexible-hour-work programs, the employee selects his or her working hours, which include specific core hours when everyone is on the job. These programs are designed to level off peak automobile arrivals and departures. They also encourage the use of ridesharing, because car- and vanpoolers can easily make their schedules coincide.

Results of variable-work-hour programs indicate no increase in the use of private automobiles. They do, however, show healthy increases in transit use (up 5 per cent in Ottawa and 6 per cent in Cambridge, Massachusetts) and ridesharing (also up 6 per cent in Cambridge). Automobiles and transit vehicles both save in travel time. For transit riders there is a swifter and less crowded ride.

An effective levelling of transit loads occurred in the Ottawa program involving federal employees. While overall transit use increased, peak 15-minute transit volume decreased 27 per cent over two years.



Compressed Work Week

This type of alternative work schedule involves a regular work week, compressed into four 9 or 10-hour days. Total weekly commuting travel for the individual is automatically reduced by 20 per cent. In cities where compressed work weeks have been tested, there has been no shift to single-occupancy automobiles and only some increase in recreational travel. The Denver program statistics show a 14 per cent overall reduction in weekly household travel for those taking part.

Steps to Take

Because of the significant benefits to municipal transportation services, a growing number of municipalities are actively encouraging employers to implement alternative work schedules. Some of the steps to take include:

- Gain experience and credibility by starting a pilot program for municipal employees.
- Identify large employment centres or major employers.
- Locate areas of major street congestion.
- Locate areas of major transit congestion.
- Determine what program would work best, taking into account the effect on transit and ridesharing.
- Calculate potential reductions in fuel consumption and changes in travel if a thorough program were introduced in a given area.
- Check for any negative impacts on the overall transportation system.
- Contact major employers and convince them of the benefits of the program.
- Coordinate program implementation.

Parking Management



If parking in a heavily congested area is expensive or difficult to locate, there will be fewer automobile trips to the area, traffic will move more smoothly through it, and people will shift to transit or ridesharing. Recent experiences with parking management in North American cities have yielded the following estimates:

- A 5 per cent reduction in parking spaces will cut car travel to the central business district by 1 per cent.
- A dollar increase in daily parking fees will cause a 1 to 3 per cent drop in the number of work trips to the downtown area.

The measures a municipality can take, then, are to control the supply of parking spaces and to regulate the price of parking. These measures have the most impact and bring the best results in city centres, in outlying employment centres, and in high-density neighbourhoods. They only work well, however when there is a fast, convenient, dependable, and reasonably priced alternative available. Moreover, consideration must be given to the effect on everyone using the area — commuters, shoppers, merchants, and employers. Special care must be taken to preserve the vitality and economy of city centres.

Controlling Parking Supply

The supply of parking can be controlled in the following ways:

- Limit or stop altogether the construction of new parking facilities. For example, parking-space requirements for new buildings can be cut back.
- Eliminate existing parking facilities.
- Eliminate parking on the street.
- Use permits in residential areas near commercial zones.
- Provide park-and-ride lots near transit.
- Give priority to carpools or set up exclusive parking facilities for them.

- Control times of parking. Municipal lots, for example, can be opened only after peak periods.
- Enforce parking restrictions.

Regulating Parking Prices

Parking prices can be regulated in a variety of ways.

- Local government can set rates for all commercial and municipal facilities.
- Increase rates, especially for driver-only vehicles.
- Extend commercial rates to private facilities. When federal employees in Ottawa were charged 70 per cent of the commercial rate for parking, 23 per cent fewer of them drove to work, and transit use and ridesharing increased substantially.
- Impose a progressive rate schedule, with increasing costs per hour, or use an hourly flat rate with no daily maximum. These measures will discourage long-term parking.
- Where appropriate, charge a flat fee for the use of parking space. This will discourage short-term use.
- Give discounts to carpools and vanpools, or subsidize them directly. In some cities, rates to carpools are one-sixth of regular automobile rates.
- Charge a parking tax on patrons of pay-parking facilities. Such taxes have generated substantial revenues for municipalities.

Implementation Steps

- Select areas where there is a high demand for parking.
- Consult with employers, retailers, and community groups in the area.
- Estimate fuel savings and changes in travel patterns of the various options.
- Implement whatever measures are appropriate, acceptable, and effective in saving energy and producing other benefits.

Auto-Restricted Zones



A number of cities have found that restricting general-purpose automobile use in selected areas can serve a number of purposes at the same time. In addition to being a major factor in shifting travel demand away from the automobile, auto-restricted zones improve transit service, reduce travel time, save energy and, generally, increase the area's appeal to pedestrians. The benefits to local merchants can be substantial. A study of cities with traffic bans in the downtown area showed increases in sales ranging from 10 to 35 per cent.

Given a high level of political, business, and public sensitivity associated with curbs on auto traffic, this measure requires careful thought and evaluation. Municipalities planning to establish an auto-restricted zone should be prepared to explain fully why such a step makes sense in today's energy reality. They should then fashion a serious process to involve interested people in coming to a decision.

Other factors that should be considered are: provision for emergency vehicles and the delivery of goods, the movement of transit in the area, the possible build-up of auto traffic around the area, and the need for proper enforcement.

Implementation Options

There are several different ways that auto-restricted zones can be implemented:

- By allowing access and egress only on major streets. These can have special express lanes for transit and ridesharing vehicles.
- By allowing only certain vehicles into the zoned area. A daily license can be used, with different prices for different kinds of vehicles.
- By allowing vehicles only at certain hours. Stickers or license-tag destinations can be used.
- By road pricing or tolls. This measure is considered the least effective.

A Team Effort

Each of the measures in this booklet — land-use planning, alternative work schedules, parking strategies, and auto-restricted zones — has the proven potential to help Ontario municipalities meet the transportation challenges of the years ahead.

Since these measures are designed to change the environment in which travel takes place, they touch on the ways that people are accustomed to doing things. Hence, in every case their full impacts should be anticipated, and dialogue with individuals and groups who might be affected should become an integral part of the process.

With the most to gain in the process, municipalities are well placed to provide the leadership required for implementation. Benefits include: significant energy savings, reduced capital expenditures, a more attractive downtown area, and a transit system used to maximum advantage.

Support and technical assistance for municipal programs is available from the provincial government. For municipalities requiring more information on the measures discussed in this booklet, or on any aspect of energy conservation in municipal transportation, the Ontario government provides the following resources.

- **The Transportation Energy Management Program (TEMP)** is a joint MTC-Ministry of Energy program concerned with the reduction of oil dependence in the transportation sector. For information, write to:
TEMP, Ministry of Transportation and Communications
1201 Wilson Avenue, Central Building, 3rd Floor
Downsview, Ontario
M3M 1J8
Telephone: (416) 248-7296
- **The Municipal Transportation Energy Advisory Committee (MTEAC)** was established to provide guidance, technical assistance, and coordination to municipalities undertaking conservation programs.
For information, write to:
Mr. Frank Cherutti, Executive Secretary, MTEAC (same address as above)
- **Travel Demand Management** — The detailed report upon which this summary booklet was based is included as Chapter 5 in the *Transportation Energy Analysis Manual* (see below).
- **Transportation Energy Analysis Manual (TEAM)** — A comprehensive summary of a wide range of conservation measures in the following areas: ridesharing, street system improvements, traffic management, road construction and maintenance, fleet management, contingency planning, managing municipal programs, and demand management. Available from TEMP (see address above).



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